



SMCJ5.0A-TR,CA-TR SMCJ188A-TR,CA-TR

TRANSIL™

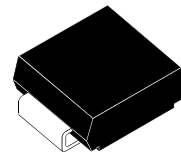
FEATURES

- PEAK PULSE POWER : 1500 W (10/1000μs)
- STAND OFF VOLTAGE RANGE :
From 5V to 188V.
- UNI AND BIDIRECTIONAL TYPES
- LOW CLAMPING FACTOR
- FAST RESPONSE TIME

DESCRIPTION

The SMCJ series are TRANSIL™ diodes designed specifically for protecting sensitive equipment against transient overvoltages.

Transil diodes provide high overvoltage protection by clamping action. Their instantaneous response to transient overvoltages makes them particularly suited to protect voltage sensitive devices such as MOS Technology and low voltage supplied IC's.



SMC
(JEDEC DO-214AB)

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^{\circ}\text{C}$)

| Symbol | Parameter | | Value | Unit |
|--------------------|--|--|----------------------|--|
| P_{PP} | Peak pulse power dissipation (see note 1) | $T_j \text{ initial} = T_{amb}$ | 1500 | W |
| P | Power dissipation on infinite heatsink | $T_{amb} = 50^{\circ}\text{C}$ | 6.5 | W |
| I_{FSM} | Non repetitive surge peak forward current for unidirectional types | $t_p = 10\text{ms}$ $T_j \text{ initial} = T_{amb}$ | 200 | A |
| T_{stg} T_j | Storage temperature range Maximum junction temperature | | - 65 to + 175 150 | $^{\circ}\text{C}$ $^{\circ}\text{C}$ |
| T_L | Maximum lead temperature for soldering during 10 s. | | 260 | $^{\circ}\text{C}$ |

Note 1 : For a surge greater than the maximum values, the diode will fail in short-circuit.

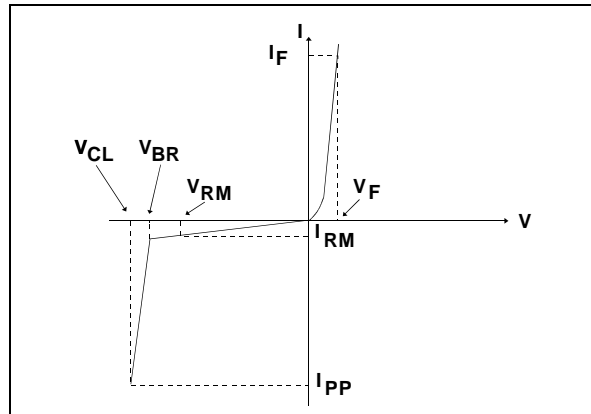
THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|--|-------|----------------------|
| $R_{th(j-l)}$ | Junction to leads | 15 | $^{\circ}\text{C/W}$ |
| $R_{th(j-a)}$ | Junction to ambient on printed circuit on recommended pad layout | 75 | $^{\circ}\text{C/W}$ |

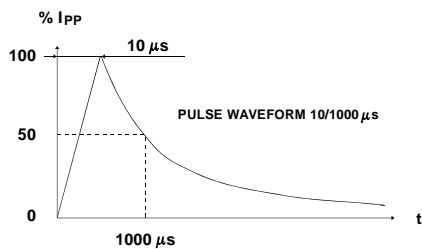
SMCJxxxA-TR, CA-TR

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$)

| Symbol | Parameter |
|------------|---------------------------------|
| V_{RM} | Stand-off voltage |
| V_{BR} | Breakdown voltage |
| V_{CL} | Clamping voltage |
| I_{RM} | Leakage current @ V_{RM} |
| I_{PP} | Peak pulse current |
| αT | Voltage temperature coefficient |
| V_F | Forward voltage drop |



| Types | | | | I_{RM} @ V_{RM} max | | V_{BR} @ I_R min note2 | | V_{CL} @ I_{PP} max 10/1000 μs | | V_{CL} @ I_{PP} max 8/20 μs | | αT max note3 | C typ note4 |
|----------------|-------|---------------|-------|----------------------------|-----|----------------------------------|----|---|------|--|------|----------------------------|-------------------|
| Unidirectional | Mark. | Bidirectional | Mark. | μA | V | V | mA | V | A | V | A | $10^{-4}/^{\circ}\text{C}$ | pF |
| SMCJ5.0A-TR | FUA | SMCJ5.0CA-TR | FBA | 800 | 5.0 | 6.4 | 10 | 9.2 | 171 | 13.4 | 746 | 5.7 | 9500 |
| SMCJ6.0A-TR | FUB | SMCJ6.0CA-TR | FBB | 800 | 6.0 | 6.7 | 10 | 10.3 | 152 | 13.7 | 730 | 5.9 | 9000 |
| SMCJ6.5A-TR | FUC | SMCJ6.5CA-TR | FBC | 500 | 6.5 | 7.2 | 10 | 11.2 | 140 | 14.5 | 690 | 6.1 | 8500 |
| SMCJ8.5A-TR | FUD | SMCJ8.5CA-TR | FBD | 5 | 8.5 | 9.4 | 1 | 14.4 | 105 | 19.5 | 512 | 7.3 | 7000 |
| SMC10A-TR | FUF | SMCJ10CA-TR | FBF | 5 | 10 | 11.1 | 1 | 17 | 92 | 21.7 | 461 | 7.8 | 6000 |
| SMCJ12A-TR | FUH | SMCJ12CA-TR | FBH | 5 | 12 | 13.3 | 1 | 19.9 | 79 | 25.3 | 394 | 8.3 | 5250 |
| SMCJ13A-TR | FUI | SMCJ13CA-TR | FBI | 1 | 13 | 14.4 | 1 | 21.5 | 73 | 27.2 | 368 | 8.4 | 5000 |
| SMCJ15A-TR | FUJ | SMCJ15CA-TR | FBJ | 1 | 15 | 16.7 | 1 | 24.4 | 64 | 32.5 | 308 | 8.8 | 4300 |
| SMCJ18A-TR | FUL | SMCJ18CA-TR | FBL | 1 | 18 | 20 | 1 | 29.2 | 53 | 39.3 | 254 | 9.2 | 3700 |
| SMCJ20A-TR | FUM | SMCJ20CA-TR | FBM | 1 | 20 | 22.2 | 1 | 32.4 | 48 | 42.8 | 234 | 9.4 | 3500 |
| SMCJ22A-TR | FUN | SMCJ22CA-TR | FBN | 1 | 22 | 24.4 | 1 | 35.5 | 44 | 48.3 | 207 | 9.6 | 3200 |
| SMCJ24A-TR | FUO | SMCJ24CA-TR | FBO | 1 | 24 | 26.7 | 1 | 38.9 | 40 | 50 | 200 | 9.6 | 3050 |
| SMCJ26A-TR | FUP | SMCJ26CA-TR | FBP | 1 | 26 | 28.9 | 1 | 42.1 | 37 | 53.5 | 187 | 9.7 | 2900 |
| SMCJ28A-TR | FUQ | SMCJ28CA-TR | FBQ | 1 | 28 | 31.1 | 1 | 45.4 | 34 | 59 | 169 | 9.8 | 2700 |
| SMCJ30A-TR | FUR | SMCJ30CA-TR | FBR | 1 | 30 | 33.3 | 1 | 48.4 | 32 | 64.3 | 156 | 9.9 | 2500 |
| SMCJ33A-TR | FUS | SMCJ33CA-TR | FBS | 1 | 33 | 36.7 | 1 | 53.3 | 29 | 69.7 | 143 | 10.0 | 2400 |
| SMCJ40A-TR | FUU | SMCJ40CA-TR | FBU | 1 | 40 | 44.4 | 1 | 64.5 | 24 | 84 | 119 | 10.1 | 2050 |
| SMCJ48A-TR | FUW | SMCJ48CA-TR | FBW | 1 | 48 | 53.3 | 1 | 77.4 | 20 | 100 | 100 | 10.3 | 1800 |
| SMCJ58A-TR | FUZ | SMCJ58CA-TR | FBZ | 1 | 58 | 64.4 | 1 | 93.6 | 16 | 121 | 83 | 10.4 | 1550 |
| SMCJ60A-TR | GUA | SMCJ60CA-TR | GBA | 1 | 60 | 66.5 | 1 | 96.6 | 15.7 | 125 | 81 | 10.5 | 1520 |
| SMCJ70A-TR | GUB | SMCJ70CA-TR | GBB | 1 | 70 | 77.8 | 1 | 113 | 13.9 | 146 | 69 | 10.5 | 1350 |
| SMCJ85A-TR | GUE | SMCJ85CA-TR | GBE | 1 | 85 | 94.4 | 1 | 137 | 11.5 | 178 | 56 | 10.6 | 1150 |
| SMCJ100A-TR | GUG | SMCJ100CA-TR | GBG | 1 | 100 | 111 | 1 | 162 | 9.7 | 212 | 47 | 10.7 | 1000 |
| SMCJ130A-TR | GUI | SMCJ130CA-TR | GBI | 1 | 130 | 144 | 1 | 209 | 7.5 | 265 | 38 | 10.8 | 850 |
| SMCJ154A-TR | GUL | SMCJ154CA-TR | GBL | 1 | 154 | 171 | 1 | 246 | 6.1 | 317 | 31.5 | 10.8 | 725 |
| SMCJ170A-TR | GUM | SMCJ170CA-TR | GBM | 1 | 170 | 189 | 1 | 275 | 5.7 | 353 | 28 | 10.8 | 675 |
| SMCJ188A-TR | GUN | SMCJ188CA-TR | GBN | 1 | 188 | 209 | 1 | 328 | 4.6 | 388 | 26 | 10.8 | 625 |



Note 2 : Pulse test : $t_p < 50 \text{ ms}$.

Note 3 : $\Delta V_{BR} = \alpha T * (T_{amb} - 25) * V_{BR}(25^{\circ}\text{C})$.

Note 4 : $V_R = 0 \text{ V}$, $F = 1 \text{ MHz}$. For bidirectional types, capacitance value is divided by 2.

ORDER CODE

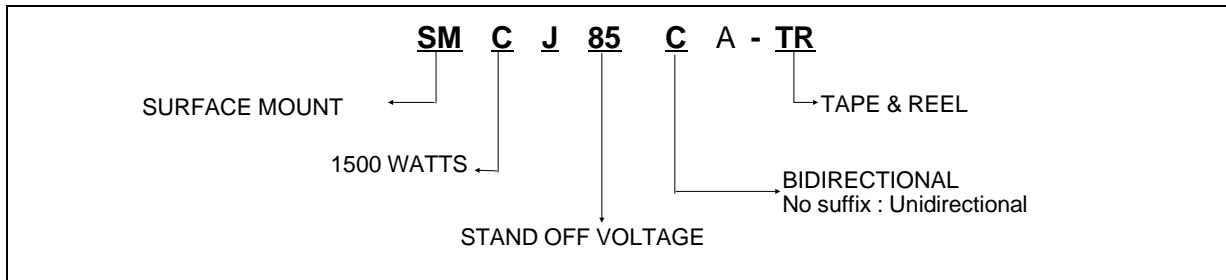


Fig. 1: Peak power dissipation versus initial junction temperature.

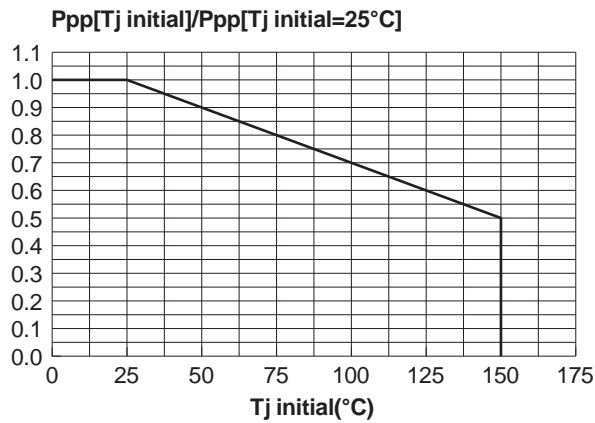


Fig. 2: Continuous power dissipation versus initial junction temperature.

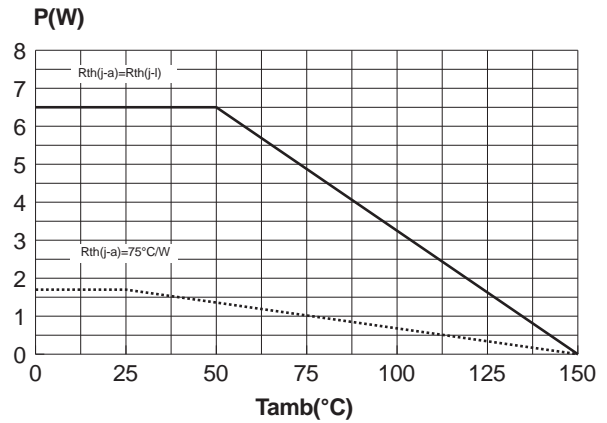


Fig. 3: Peak pulse power versus exponential pulse duration (Tj initial=25°C).

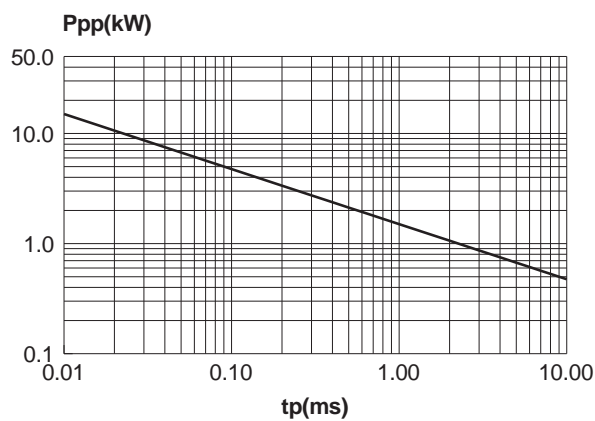


Fig. 4: Clamping voltage versus peak pulse current (Tj initial=25°C). Exponential waveform tp=20μs & tp=1ms.

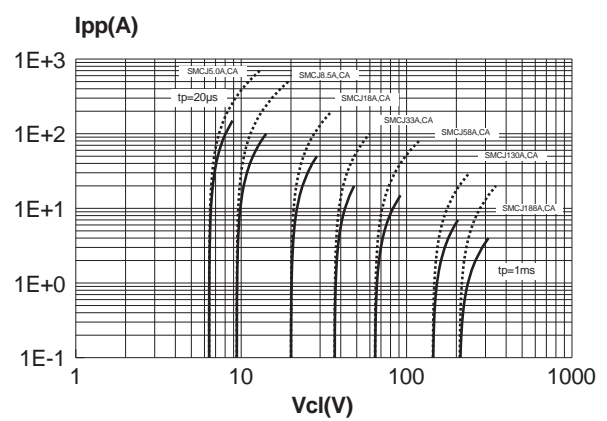


Fig. 5-1: Capacitance versus reverse applied voltage (typical values) (SMCJxxA series).

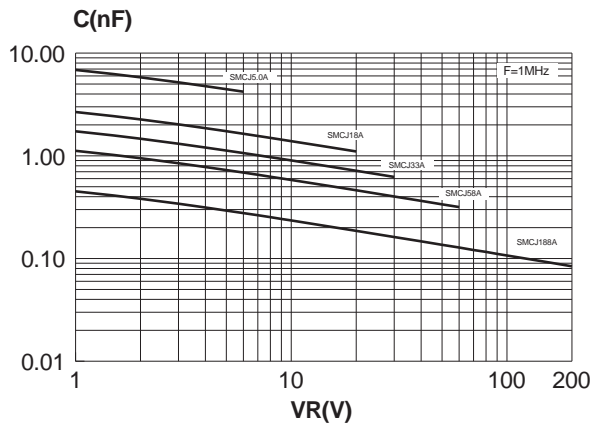


Fig. 5-2: Capacitance versus reverse applied voltage (typical values) (SMCJxxCA series).

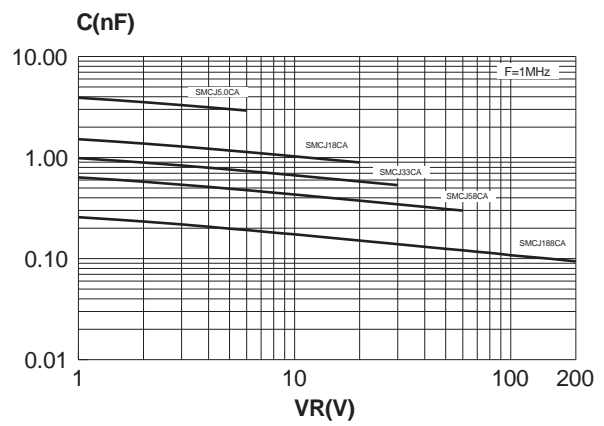


Fig. 6: Peak forward voltage drop versus peak forward current (typical values).

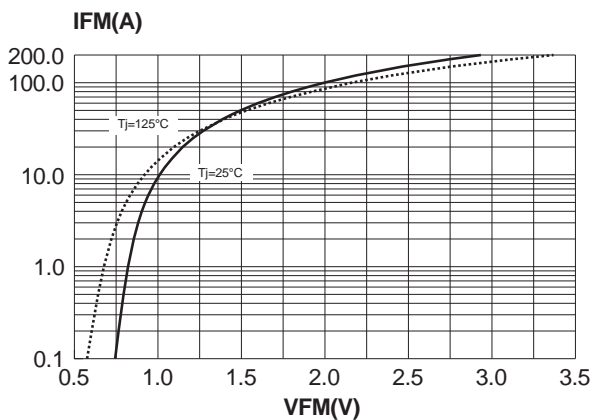


Fig. 7: Relative variation of thermal impedance junction to ambient versus pulse duration. (Printed circuit board FR4, S(Cu)=1cm²).

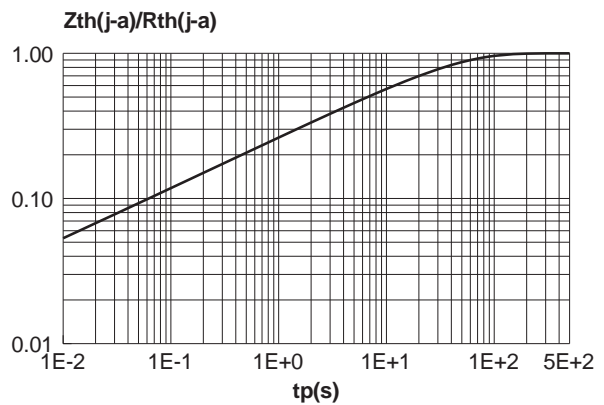


Fig. 8: Thermal resistance junction to ambient versus copper surface under each lead (Printed circuit board FR4, e(Cu)=35μm)

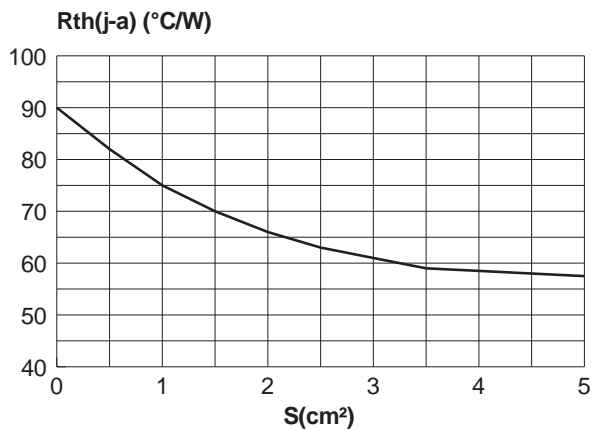
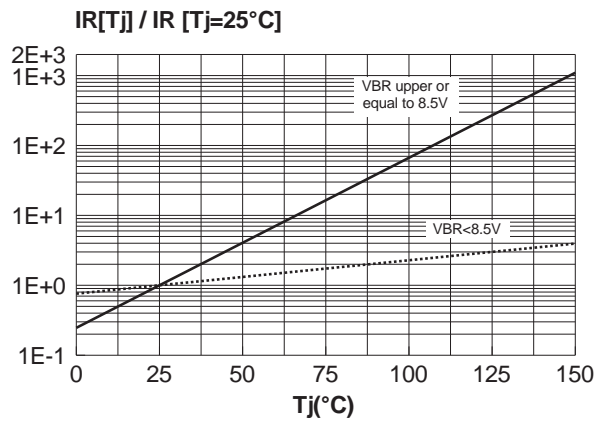
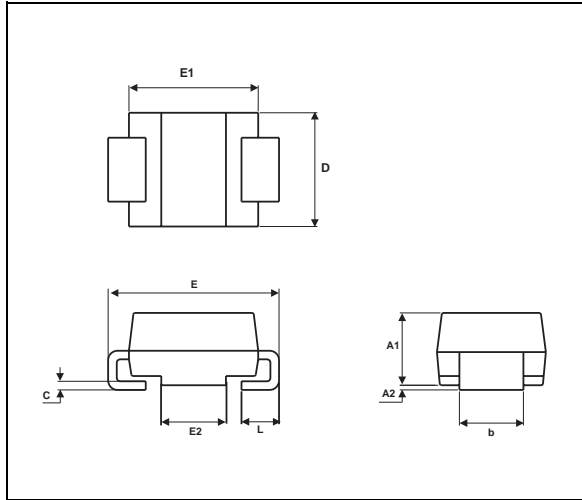


Fig. 9: Relative variation of leakage current versus junction temperature.



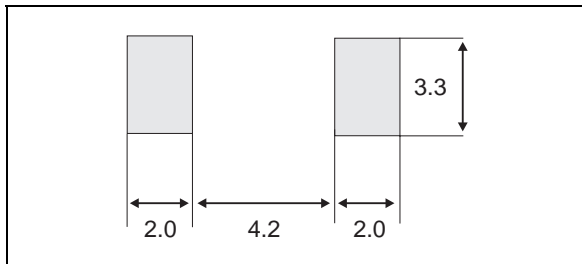
MARKING : Logo, Date Code, Type Code, Cathode Band (for unidirectional types only).

PACKAGE MECHANICAL DATA
SMC (Plastic)



| REF. | DIMENSIONS | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.45 | 0.075 | 0.096 |
| A2 | 0.05 | 0.20 | 0.002 | 0.008 |
| b | 2.90 | 3.2 | 0.114 | 0.126 |
| c | 0.15 | 0.41 | 0.006 | 0.016 |
| E | 7.75 | 8.15 | 0.305 | 0.321 |
| E1 | 6.60 | 7.15 | 0.260 | 0.281 |
| E2 | 4.40 | 4.70 | 0.173 | 0.185 |
| D | 5.55 | 6.25 | 0.218 | 0.246 |
| L | 0.75 | 1.60 | 0.030 | 0.063 |

FOOTPRINT DIMENSIONS (Millimeter)
SMC Plastic.



Packaging : standard packaging is in tape and reel.

Weight : 0.25 g

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